

Fracture energy of weak snowpack layers

Jürg Schweizer; **Alec van Herwijnen**; Benjamin Reuter

WSL Institute for Snow and Avalanche Research SLF, Davos, Switzerland

Recent experimental and theoretical work has provided new insight into weak layer fracture in view of dry-snow slab avalanche release. The two main parameters which influence this process are slab stiffness (i.e. elastic modulus) and weak layer fracture energy. These parameters are therefore of importance for avalanche forecasting. So far, only few values of specific fracture energy exist, mainly because the stiffness of the slab cannot easily be determined. We performed about 150 propagation saw tests to calculate weak layer fracture energy. To estimate the stiffness of the slab that is required for the calculation, we applied two methods: (1) in-situ penetration resistance measurements, and (2) video im-aging of the fracture process. Both methods provided values of the average slab modulus on the order of a few MPa. The resulting weak layer fracture energies ranged between 0.28 and 2.2 J m⁻² – considerably higher than previously published values. Many more measurements are needed for a comprehensive dataset of weak layer fracture energy.